

BIBLICAL CREATION

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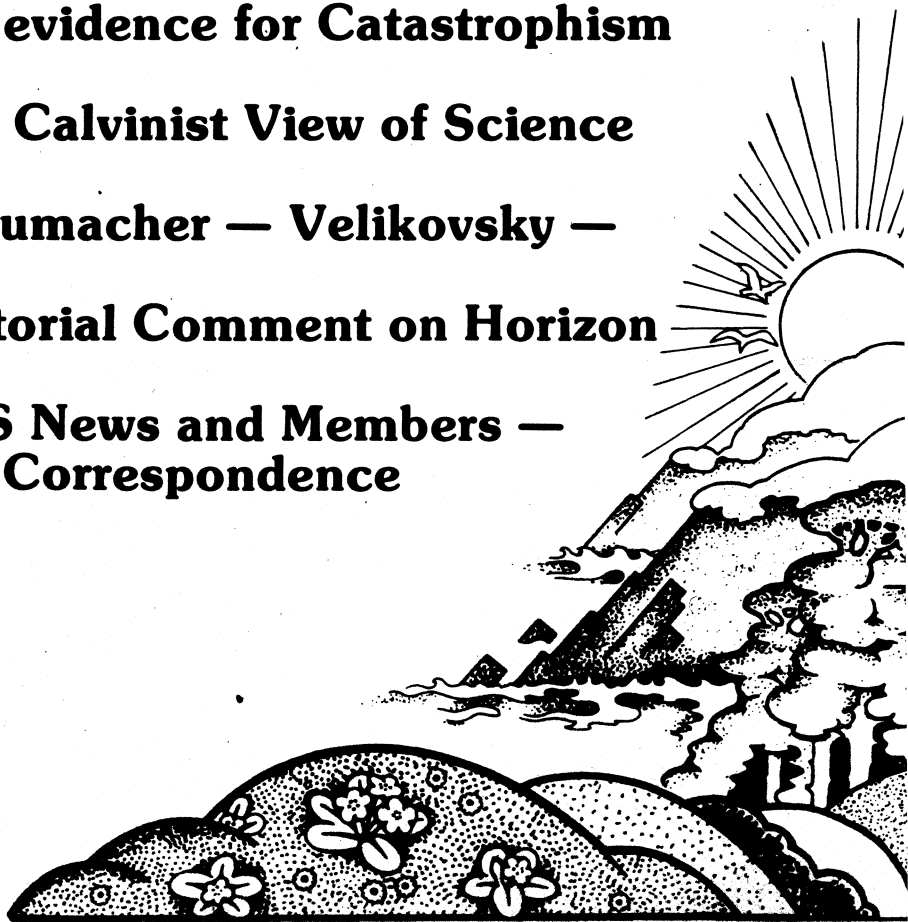
**Coal and the Flood:
evidence for Catastrophism**

The Calvinist View of Science

Schumacher — Velikovsky —

Editorial Comment on Horizon

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EDITORIAL

THE EMPEROR'S CLOTHES

The recent BBC2 *Horizon* programme about the current state of evolutionary theory was watched avidly by many connected with BCS, as the press publicity announcing it spoke of 'Biblical Creationists' as among those whose opinions were to be discussed. In the event no mention was made of creationism in Britain, though our colleagues in the United States were given a fair hearing. Norman MacBeth, that trenchant (though not creationist) critic of Darwinism, made a number of telling contributions, and the production team had gone to the trouble of filming at the *Institute for Creation Research (ICR)* at San Diego, California. Duane Gish was interviewed, and among other things he was permitted to recite a list of the impressive credentials of the staff at *ICR*. One could, of course, have wished for more contributions from the creationists, but it would be churlish to say that too loud. The BBC are to be congratulated on taking our point of view seriously, in the context of a very serious discussion.

The central thrust of the programme was that the fossil record, so long regarded as the great authority for Darwinian evolution, is now widely recognised not to fulfil Darwinian expectations. As creationists have been saying all along, it does *not* provide evidence of the gradual changes and intermediate forms required by the Darwinian model. What it *does* show is, of course, another matter. *ICR* and likeminded Christians have their alternative reading of things! But for the evolutionist it is not the end of the road. He still believes in evolution, but he must find a way of understanding it that will square with this new and more candid reading of the fossils—one in which the 'jumps' are sudden and dramatic. That is no easy task, but we must not be surprised if he finds a convincing alternative model.

Yet, all of a sudden, we are finding an openness on fundamental issues which we have not before met since the evolutionary consensus set in its classic form (for example: have the BBC ever before done a serious television documentary featuring the creationist alternative?). The recent discussion in *Nature* about the new British Museum evolution exhibition will be reviewed in the next issue of *BC*: it is another evidence of this new self-questioning among evolutionists in the face of unpalatable evidence. This is all very gratifying to us, but it must not make us complacent. We have several times in this journal pointed to the *necessity* of evolution for the secular mind, irrespective of this evidence or that. The consensus will re-form around some new understanding of evolutionary change that acknowledges the absence of intermediate fossil forms. The emperor, persuaded of the inadequacy of his attire, will repair to his dressing-room; and we shall then have to show him that his *new new* clothes come from the same tailor and are of the same quality as those he has laid aside. It is his old clothes he needs to get back.

N.M. de S. Cameron

The Biblical Creation Society and the future

Appointments

At a recent meeting the BCS Committee made a number of important decisions about the future of the Society. Two part-time posts have been created, that of *Administrative Officer* (to which Mr Nigel Vaux Halliday, BA (Cantab), MA (Lond), has already been appointed), and that of *Education Officer*, advertised last month in the Christian press. The Education Officer will hold a number of responsibilities, including in particular co-ordinating the production of two series of filmstrips for the Society.

Publications

Plans were also laid for two series of publications. At a popular level, a number of pamphlets under the general title 'Thinking again about . . .' will soon begin to appear, dealing briefly with key issues in the debate. At a more technical level, a monograph series is to be published under the title the *Biblical Creation Supplements Series*. We hope to make available serious discussions of scientific and theological questions which are too lengthy and/or too technical for inclusion in *Biblical Creation*, but which commercial publishers would not accept because of their limited market. We believe it is of great importance to stimulate serious writing and research and for it to be disseminated as widely as possible. We hope to produce two or three each year, and will be inviting readers to place a standing subscription so that they will receive and be invoiced for each issue as it comes out. Suggestions for monographs and comments on these plans will be welcomed.

BC subscription rates

The current BC price, fixed in June 1980, is actually no higher than the cost of our first issue in October 1978. Increased printing costs and postal rates now make a price increase unavoidable, and the subscription rate (to Biblical Creation only) will be increased to £2 per year (3 issues) and 70p per single issue, starting with the February 1982 issue (4:11). Student subscriptions will be unchanged. This substantial increase will allow us to increase both the size and production quality of the Journal, an improvement which we hope will be seen already in this issue; it will be possible to include photographs in future issues. As from January 1982 all BC subscriptions will be adjusted to run for a full calendar year (Jan-Dec), but subscription renewals received before Nov 1st 1981 will be honoured for 1982 at the existing rate. Further details in the next issue.

BC volume/issue/page numbering

Some confusion has arisen over the volume/issue numbering system used for *Biblical Creation* since 1980. The first digit shown defines the volume (i.e.

year): thus volume 3 for 1981. The second shows the issue number, independent of volume: thus 1. for Oct 1978, 9 for June 1981, etc. Page numbering restarts at p.1 at the start of each volume. All 1978-79 issues (1-4) are in volume 1 although no volume numbers appear on these. References need refer to volume and page number only; thus "vol 2. p.53" or 2.53 refers to page 53 in BC 2:6. This system follows the convention used by a number of scientific journals.

Correspondence

Dear Sirs,

The presence of Mr David Silversides' plea for Christian schools in your journal I do not in the least find surprising, for it is the fact that the evolutionary model is assumed to be true in so many biology classrooms which makes it pernicious. However, when on the grounds of Eph. 6:4, this author virtually accuses all parents who do allow their children to attend state schools of failing to bring them up according to the will of God, I feel that I must object. I would not try to persuade Mr Silversides away from his point of view; I would beg him to admit that it is possible to be a responsible and godly Christian parent whilst disagreeing with him.

I would not send my children to a private Christian school in the present circumstances in either Britain (my native country) or France (where I live), and that for the following reasons.

1. This would mean sending my child away from home. I do not believe this to be the best way of discharging my parental responsibility before the Lord. Even if I knew of a school where all the teachers were of unimpeachable moral character, absolutely sound in doctrine, and thoroughly expert in their academic subject, I believe that I would be wrong to delegate to them the responsibility of the upbringing of my children. In fact I am rather worried about Mr Silversides' whole educational theory there. The tendency at the moment is to delegate far too much education to the school. Home is primarily the place for moral, religious, and, for that matter sexual education.

2. In contributing to a private school system, I would be reducing the numbers and influence of believing teachers in state schools. This is important for two main reasons. It would place at a disadvantage Christian parents who could not afford education—and it would eliminate the slightest possibility of setting an example to children from non-Christian homes.

3. Whilst I would not argue that the objections considered by Mr Silversides are necessarily valid, I do think that it is possible to exaggerate the influence of non-Christian teachers. Children are not as undiscerning as some people

think, and are quite capable of accepting a teacher's authority on mathematics, whilst ignoring, and even rejecting his moral views. I am not convinced that a christian private school system has all the answers anyway. Pacifist teachers will not put an end to cops and robbers in the playground—and can I be sure that these christian teachers will be pacifists? There will always be disagreement between parents and teachers and I remember from my own school days many more disagreements with my R.I. teacher than with my biology teacher . . . a practising anglican who believed in evolution.

There is much more one could say, but I believe that the above is sufficient to show that the answer to the question posed by Mr Silversides' article is not as simple as he apparently believes.

Yours most sincerely,

R.A. Limb,
15 rue Alfred de Musset,
92240 MALAKOFF, France.

Dear Sir,

Permit me to question the wisdom of printing the article by David Silversides, entitled 'Do we need Parent-Controlled Christian Schools', in *Biblical Creation* 3:8.

Immediately I must say that I totally reject all Mr Silversides' conclusions, finding his arguments extremely dubious and at times a distortion of the scriptural 'evidence'. Furthermore, his 'objections' were straw men that totally failed to answer the major criticisms against private Christian education.

However, the point of writing to you was not to state an alternative position. It was to say that I found the article *irrelevant*. If Mr Silversides had used it to discuss the teaching of science in state schools, I could have understood its point in being in *Biblical Creation*. However, the only mention made of science education was in the first paragraph, and then only in passing before Mr Silversides got onto the main point of his article. Can we now expect *Biblical Creation* to publish articles on politics, economics, history, social work, etc., provided they mention 'evolution' at least once?

Certainly, encourage a debate on science education and the place of creation within it, but please do not allow *Biblical Creation* to become a platform for any and all viewpoints which are really not the direct concern of those who subscribe to the journal. We will debate these issues on a separate forum.

Correspondence

However, let me finish on a positive note. As a non-specialist without little scientific background, I find *Biblical Creation* extremely helpful. The articles are always written clearly without jargon and this certainly helps an 'outsider'. Maybe it is for this reason that I do not want *Biblical Creation* to cover irrelevant material!

Yours sincerely

David Bell,
177 Knightswood Road,
Glasgow G13 2XL

Dear Sir,

May I make two comments arising from my reading of the current issue of *Biblical Creation* (Feb 81).

(i) In connection with Mr David Tyler's review article 'The Legacy of the Midwife Toad'. May I draw readers' attention to a chapter entitled "Materialism and Genes", especially sections 4 to 10 pp. 195-209, of Dr Wilder-Smith's book *A Basis for a New Biology* (Telos International 1976). These pages contain a lucid account of how the development of an individual could depend on the interaction between the genetic information present and the environment which 'triggers off' that information. Dr Wilder-Smith describes five examples, including that of the Midwife Toad.

(ii) With reference to the article 'Creation in the News' by the Revd Nigel M. de S. Cameron, and especially the remark that "The time for Creationists to throw their hats in the air will come when the secular scientific world feels it must begin to *answer us*", the following extract from a news item in *ICR Acts & Facts* Nov 80 should be of interest:

'According to a news article in the July issue of *American Biology Teacher*, it has been "agreed that NABT (National Association of Biology Teachers) should assume leadership of a national effort to meet the challenges posed by creationists." Among other things, NABT will attempt "to provide accurate information on evolution, scholarly critiques of creationist arguments, and a communications network."

Yours sincerely,

L.J. To
107 Fullers Way South,
Chessington, Surrey.

FLOATING FORESTS ON FIRM GROUNDS

Advances in Carboniferous Research

Joachim Scheven

Dr Scheven, a palaeontologist, prepared this paper for a convention of the *Bible-Science Association* in the United States. We are grateful to him for permission to reproduce it here. Readers of German will be interested to know of his beautifully illustrated book *Daten zur Evolutionslehre im Biologieunterricht*, (Stuttgart, 1979) a powerful critique of the argument for evolution from fossil evidence. A technical discussion of the material of this paper is available in the author's series of *Karbonstudien* published in the periodical *Factum*. Dr Scheven's address is Milsper Str. 146, D-5828 Ennepetal 13, West Germany.

Introduction

The question whether the plant matter of coal seams has grown *in situ* or has been drifted into place touches the Christian's conviction about the reliability of the Genesis record. Either, vegetable matter has repeatedly accumulated for many thousands of years and was buried and transformed into coal. In this case of *autochthonous* growth the chronology of the Bible of at most 6000 years since Creation is ruled out. Or, floating forests were set on swiftly dumped-down sediments. If so, the time required for this *allochthonous* formation of coal could be accommodated within a relatively short period well within the Biblical time scale.

LOGAN, GOEPPERT, and LYELL were the first geologists of influence to promote the *autochthonous* theory which has since gained almost universal acceptance. Although it is now taught at practically all schools and universities, relatively few teachers have actually seen and touched a coal seam so as to be able to speak from their own experience. Perhaps even fewer have perused the vast amount of literature relating to the geology of coal in order to arrive at independent conclusions. A deep split between academic opinion and the actual facts has been the result. Many of the notions of how coal was formed are not in accord with the fruits of more recent research and are therefore in urgent need of revision.

I. Cyclothem Theories Untenable

Conflicting concepts

The theory of recurring *cyclothems* attempts to account for the repetition of certain rock layers within the Coal Measures. Unfortunately for the theory, cyclothems have been made to begin with either sandstone (WELLER), shale (TRUEMAN) or with the underclay of the coal member (JESSEN) of a

cyclothem. Since all three concepts can be equally well defended it remains uncertain where the turning point between two consecutive cyclothem should be fixed. Most likely, there was no turning point at all but simply a continuous process of sedimentation with no major breaks for the assumed growth of coal swamps.

Vertical and horizontal anomalies

A typical cyclothem includes a succession of strata of which—in ascending order—sandstone, underclay, coal, and shale are the indispensable regular members. There are, however, notable exceptions to this rule. The order of shale and sandstone between two coals may be reversed, or, there may be a *gradual* change from shale to sandstone instead of the necessary clear-cut division. In fact, the ideal cyclothem is very rarely developed. Besides the described anomalies cyclothem are prone to change laterally. A coal seam may be interrupted somewhere and replaced by a massive limestone. Or, a continuous shale may harbour a large lens of sandstone thus simulating a genuine cyclothem boundary at their junction. There may be even cyclothem with fully developed coal seams which are marginally supplanted by a continuous shale.

Results of regional seam correlations

Attempts at correlating individual coal seams of different mines in West European coal fields have yielded remarkable results. If viewed in section, coal seams which are considered to represent one geologic time mark each tend to coalesce or to split over a distance of only a few kilometres. Cases are known where two separate well-defined seams are connected by a slanting third coal band producing what is termed a Z-connection. With such possibilities actually occurring the use of seams as time marks is obviously vitiated.

II. Worldwide Evidence of Rapid Sedimentation

Preponderance of current-bedded sandstones

The annual accumulation of sediment during Coal Measures times has been estimated at 0.25 mm per annum. Contrary to this widely-held opinion the formation of Carboniferous rocks has been very fast indeed. Among coal-bearing sediments sandstone is usually well represented and, in some cases, may occupy as much as 80% of the total thickness of strata. Deposition of sand requires moving water and accordingly, the accumulation of current-bedded sandstones of various types is quite rapid. Quartz conglomerates, large boulders, and wood debris are frequent inclusions in Carboniferous sandstones witnessing to the powerful forces at work. Sandstone layers of one or even several metres thick can thus be shown to have been spread within one single tide of sediment-laden water.

Rapid deposition of fine-grained sediment

Fine-grained siltstones and shales are usually even-bedded and considered proof of slow accumulation under quiet conditions. Aligned plant remains, freshly embedded fern leaves in roof shales, flute casts on undersurfaces of thick silt—and mudstones, and the general absence of bioturbation (= disturbance by mud-living organisms) are pointing in most cases directly to a turbiditic (= submarine mudflow) origin. It is now known that compaction of some of these sediments was completed within the shortest of time, apparently under the load of the rapidly increasing overburden.

Polystrate tree trunks

The sudden deposition of sediments is vividly demonstrated by the burial of upright lepidophyte tree trunks examples of which are known to exceed 8 and even 10 metres. These relatively frail and short-lived bark trees of the Carboniferous could not possibly have survived the process of silting in during hundreds of years of assumed subsidence of the coal forests. The abrupt entombment of these trunks is demonstrated by the observation that the sediment layers filling the hollow columns frequently differ from those around, e.g. there may be shale within and sand without or vice versa. Some of these trunks at the coast of Nova Scotia have yielded remains of vertebrates trapped under such injected mud or sand.

Fossil earthquakes

Certain coal beds in the USA and in England are pierced or torn by dykes of sediments from below. The sediments under such coal seams are greatly disturbed while the dykes may carry so-called horsebacks on top where they issue above the coal. The disturbances are rightly regarded as the result of violent earth shocks which have forced the loose water-logged sands upward through the pre-coal peat. This is proof that the peat of the coal seam did not accumulate during thousands of years but, instead, was laid down as a whole on a fresh and still water-imbibed sediment.

Diachronic kaolin bands

In European coal-fields certain coal seams contain thin partings of kaolin clay stone (tonstein), also called kaolin bands. Although their origin has been much under debate they seem to be connected with the fall-out of volcanic ashes. They are therefore believed to be the most accurate time markers of the Coal Measures and have been of some value in correlating coal seams over great distances. Despite their usefulness in identifying coal beds, certain kaolin bands are known to pass *diachronically* from the coal itself into either the overlying or underlying rocks. Thus the kaolin band of the seam Zollverein 8 of the Ruhr coalfield is actually oscillating within solid 9 metres of sediment. If tonstein layers are petrified remains of single fall-outs of ash the conclusion is

inescapable that the rocks below the coal, the seam itself, and the overlying rocks are all contemporaneous.

III. Sedimentary Origin of So-called Seatearths

Allochthony of Gondwana coals admitted

Most coal beds of the Northern Hemisphere are underlain by root-traversed underclays or seatearths. If these seatearths are true fossil soils then all controversy about the autochthonous or allochthonous theory is ended. It is interesting but little known that the mighty coal deposits of the Southern Hemisphere, the so-called Gondwana Coal, are lacking such seatearths throughout. The allochthonous origin of those coals has been therefore generally admitted. This means that some form of floating vegetation did exist at all events and it remains to be shown how the northern coal-producing plants compare to the floating *Glossopteris* flora.

Diversity of seatearths

The seatearths of the Euraméric coals commonly consist of purplish-black clays thickly permeated by stigmarian rhizomes and their adhering appendices. However, many exceptions occur. Seatearths frequently contain an admixture of silt or sand, or, rarely, they may consist of pure sand or even limestone. In the writer's collection there is a *Stigmaria* on a bedding plane of cannel coal (=light-weighted coal of algal origin)—truly a variety of soils which cannot be reconciled with the demands of any modern plant as far as is known.

Graded bedding and stratification in underclays

Seatearths with a component of sand or silt are laminated or stratified due to the differential segregation of particles during the settling process. All seatearths are radically different from true soils by the absence of a crumbly or flaky texture. This untouched condition betrays a sedimentary origin. That underclays are not at all soils is further substantiated by the observation that sandy underclays tend to grade into coarser fractions towards the bottom. Graded bedding is a sure sign for an uninterrupted sedimentation.

Alignment and preservation of roots

That the so-called seatearths cannot be fossilised soils is again borne out by their contents of organic remains. Not infrequently fern leaves, lepidophyte bark, or marine organisms are found together with the stigmarian rootwork of the coal vegetation. The stigmarian axes have occasionally been found to be in drift-aligned position, while the surrounding appendices may be found compressed on split rock surfaces contrary to their natural arrangement of growth (to be dealt with below).

IV. Ecology of Lepidophytes

Anatomy of arboreal lycopods

The mighty trunks or stools of Carboniferous trees seen in museums are not solid wood but casts of hollow stems. All trees of the coal forests were either hollow or otherwise lightly-built structures. Of these the arboreal lycopods (=clubmoss relatives) are the most important. The trees of *Lepidodendron*, *Sigillaria* and related genera were supplied with mineral nutrients and water through a central cylinder, while a tough and ever widening ring of bark was rendering structural support. The space between bark and central cylinder was largely filled with aerenchyma (=air tissue).

Horizontal rootwork and lamp-brush appendices

The described trunks rose above four cross-shaped equally air-filled main roots which in turn were forked dichotomously and extended away from the stem as much as 20 metres horizontally. These air-filled root axes or *Stigmariae* were all around covered with radiating appendices, i.e. pencil-thick organs up to $\frac{1}{2}$ m long which again seem to have contained little but air. Frequently they are preserved in the rock in their original lamp-brush position. Such growth pattern is characteristic of submerged plant organs, whereas terrestrial roots always follow geotropism to some degree. The stigmarian axes were thus forming a network of roots in water over which the tall trunks could stand up erect. The leafy tops of these trees were quite small. The fact that disused appendices of older *stigmariae* fell off at preformed abscission layers leaving behind the well-known circular scars is further proof that the coal-forming lepidophyte forests never grew on firm ground but were floating coherently on the surface of vast but probably shallow bodies of water.

Accessory vegetation

Although much of the Carboniferous coal seems to have derived from lepidophytes, the most common plant fossils met are fern leaves in the roof shales. Carboniferous ferns—unlike those of the present—were mostly seed-bearing, their fronds being borne on stems of some metres height. Little is known about the roots of these seed ferns, for they are never encountered in underclays where lycopod roots abound. Seed ferns seem to have rooted above the matted and interwoven *Stigmaria*-tangle in a thick layer of humus formed of leaf litter. They represented probably the undergrowth of the coal forests. Another important element of coal forests was formed by *Cordaites* trees, distant relatives of the surviving conifers. Again, their roots are not found among the *Stigmariae* of the regular seatearths. *Cordaitean* tree trunks were enclosing a wide pith lessening their weight. One *Cordaites* species is said to have grown on stilt roots like mangrove trees of tropical shores of today. It seems certain, that *Cordaites* trees, too, grew on the humus layer accumulating above the stigmarian roots rather than from the level of the

underclay itself. Some coal-bearing strata show a greater percentage of giant horsetails. Again, *Calamites* stems were essentially hollow, reducing their bulk weight to a trifle. Cross-sections of *Calamites*-roots disclose large air spaces which are to be interpreted as submerged organs. The giant horsetails were probably growing rather by themselves, perhaps replacing dense lycopod jungles in pioneer situations.

Rafted boulders in seams

From all coal fields occasional foreign boulders are reported to be contained in pure carbonaceous matrix of seam coal. From where these quartzitic or crystalline boulders and pebbles originate is in most cases unknown, but they were incorporated into the coal most certainly from above. Whatever their derivation, the existence of boulders in undisturbed coal is incompatible with the theory of autochthonous growth of coal swamps. Rather they seem to have been flung onto the drifting plant rafts by wave action.

V. Missing Evolutionary Change

Perpetual species, forerunners and latecomers

One should expect that during the estimated 30 million years or so of the Coal Measures period the consecutive seams would exhibit some sort of evolution of plant life. The fact is that the great majority of coal-age species has no stratigraphic value at all. Either they are passing right through or appear as unexpected forerunners or unwelcome latecomers somewhere in the stratigraphic column of the Carboniferous. The numerical distribution of single species may vary from horizon to horizon by which seams may be safely distinguished. But the point is that from their first occurrence upwards the same species continue unaltered through the subdivisions of the column and do not show the least signs of an evolutionary change.

Non-marine mussels

Another instance cited in favour of Evolution have been the assemblages of so-called marine mussels. These mussels are usually crowding some layers above the roof shales but may also appear below the coal or in partings of the seam itself. In England and Western Europe a sequence of such shells of different shapes and sizes has been worked out which is said to represent their evolutionary change in time. While such successive assemblages can be distinguished by different mean characteristics the individual shells of any one mussel bed may vary and intergrade so greatly as to render the distinctions between species meaningless. Besides this the European sequence cannot be applied to the conditions in North American coalfields.

VI. How Coal Was Formed

The peat-coal equivalent

Vague speculations of the past have fixed the peat-to-coal ratio somewhere at 12 (20) to 1. This meant that a coal seam of 1 metre would have been compacted from 12 to 20 m peat which, of course would have required many thousands of years to accumulate. If however the calorific values of equal volumes of coal and peat are compared the ratio is only 2.3 to 1, and comparing the specific weight of these two the ratio comes down to 2.2 to 1. In other words a layer of 2.3 m peat would produce 1 m coal. The same result has been obtained by measuring the compaction of coal around coal balls (=globular concretions of dolomite-, siderite-, or pyrite-impregnated tissues). It can therefore be assumed that the normal thickness of a living coal forest soil (or raft) was something like 2 metres. Most coal seams thicker than 1 m are internally separated by dirt partings indicating that one or more rafts were superimposed at burial. (The enormous beds of Gondwana Coals, of Mesozoic and Tertiary brown coals and lignites consist of different plant material and cannot be compared with the mode of formation typical for that of the Carboniferous.)

Coalification in the laboratory and contributing factors in nature

What happens during transformation of peat to solid coal is but poorly known. The general belief is that thousands or millions of years were required for this process. Obviously, compaction to coal has something to do with pressure from the overburden and also, possibly, with the internally generated heat of the Earth's crust. The assumed conditions can be simulated in the laboratory to some extent. For instance, it has been repeatedly demonstrated under artificial conditions that woody substance exposed to *vibrating pressure* comes nearest to the quality of a high rank coal. Not continuous pressure but a prolonged series of brief violent shocks will alter the molecular arrangement of the organic matter to resemble coal. Such coal can be produced within hours and days. A natural process leading to the formation of coal can be seen in the occurrence of earthquakes as was already mentioned. Pressure would have been supplied by the rocks resting above the vegetation debris while vibrations were generated from within the Earth's crust. It is certain that coalification under natural conditions was a quick process far from needing long periods of time, for many examples are known where dislocated fragments of mature coal are found enclosed in sandstone which is nearly contemporaneous—as we have seen—with the nearest coal seam above or below.

The story of coal balls

That compaction of peat to coal bypassed the natural course of gradual decay of plant matter is strikingly demonstrated by the microscopic structure of coal balls. These coal balls are mineral inclusions within the coal matrix of a seam

derived from mineral-rich brine solutions which must have percolated into the peat from a “transgreeding sea” above. Most if not all of our knowledge of the histology of coal plants has been derived from sections through such coal balls in which the minutest details of cellular anatomy are preserved for study. Plant organs which have been totally altered and compressed to coal outside a coal ball have remained practically intact where the same structures pass through it. That the Carboniferous coals were formed from fresh vegetable matter directly turned into a compact seam is therefore beyond question.

Conclusion

This brief summary could only touch upon the main facts now known to have played part in the formation of Coal Measures deposits. There is absolutely no evidence that these rocks were laid down during hundreds of thousands or millions of years. On the contrary, through what has been learned about seatearths, ecology and anatomy of the coal-forming vegetation during the last two decades of research it has become abundantly clear that we have to do with a special type of floating forest nowadays utterly unknown which must have covered millions of square kilometres of shallow and perhaps tide-subjected waters before these mats were torn off by force and drifted into rapidly filling depressions of the then unstable surface of the Earth. This explains why Carboniferous seams are almost invariably found above each other. In the writer’s belief the sediment-filled depressions of the present-day’s coalfields coincide with the fountains of the deep being stopped of the Noachian Flood (Genesis8:2). While this is wholly the domain of faith, the currently popular view of a Coal Age with swamps developing over slowly heaving and sinking mud flats is in poor accord with the known data and creates more scientific problems than it is pretending to solve.

‘BRIGHTER VIEWS OF HIS GLORY’
Calvinism and Science
John Sharp

Many readers appreciated Dr Sharp’s article on *Teaching Science in a Christian Perspective* in BC2:7. Before he entered the ministry of the Church of Scotland he was awarded a Ph.D. for his thesis on the philosophical, religious and theological foundations of the natural sciences.

There can be little doubt that our lives are dominated by science and technology at work, home and leisure. Yet for many the origins of modern science are lost in the mists of antiquity. It is generally agreed that modern science began in the 16th and 17th centuries. But what were the reasons for its rise at that time and not another? What did those engaged in science at that time think they were doing? Why did science arise in Europe and not somewhere else? Many reasons have, of course, been forthcoming. Social reasons such as the voyages of discovery; the fusion of craft and theory; capitalism; and new technologies have all been pointed to. But in discussing the rise of modern science one significant feature is often either ignored or played down as of little importance or even attacked as negative—the Reformation.

Charles Singer, a leading historian of science, has contended that: “The reforming leaders were, if anything, less sympathetic to scientific investigations than the Catholic leaders.”¹ Robert Merton—a sociologist who extended Weber’s thesis into the realm of science and showed a statistical relation between Calvinistic centres and the rise of modern science—claimed, however, that Calvin depreciated science. Indeed it would seem that many commentators construct complex arguments to avoid attributing plus marks to the Reformation.

What was the general Protestant attitude to science? Was it hostile, neutral, or conducive to the pursuit of scientific activities? Was there, or was there not, a dependent link between Calvinism and science? It seems quite wrong to dismiss the Reformation out of hand when science blossomed precisely in those geographical areas which were the home of the Reformation—the Lowlands, England and Scotland. As Havelock Ellis notes in his *Study of British Genius*, Calvinist Scotland produced many eminent men of science while Catholic Ireland produced virtually none.

A focal point for present day attack on the Protestant perspective on science is the so-called Copernican revolution. It is widely claimed that Luther and

Sharp: Calvinism and Science

Calvin were intransigently opposed to Copernicus and his sun-centred theory, although in fact the sun was not the precise centre of his theory. To concentrate my presentation here let me focus on the argument of T.S. Kuhn, one of the leading philosophers of science today, though similar sentiments are found in Gillespie and Kearney among others.

The heart of the matter is certain oft repeated quotations from Luther and Calvin which Kuhn uses in a way designed to paint them in the blackest possible manner². Leaving Luther aside, although he can be similarly vindicated, let us concentrate on Calvin. After attacking Luther, Kuhn writes³:

“Other Protestant leaders soon joined in the rejection of Copernicus. Calvin, in his ‘Commentary on Genesis’, cited the opening verse of the Ninety-third Psalm—‘the earth is established, that it cannot be moved’—and he demanded, ‘Who will venture to place the authority of Copernicus above that of the Holy Spirit.’”

Now this quotation (‘Who will venture . . .’) is often cited as a case in point against Calvin. Certainly Calvin wrote in many places—Psalms 19 and 93 for example—in a manner that assumed the correctness of the Ptolemaic, earth-centred, system. But then for a theologian, this was but the equivalent of the contemporary theologian who assumes the correctness of relativity theory. Calvin was simply operating with the consensus of scientific opinion for his age. Copernicus’ theory was not accepted till much later, even being refuted by astronomers well into the 17th century.

But even more important: Kuhn is not fair when the above quotation is looked up in his references we find it is attributed not to Calvin at all, but to Melancthon’s *Initia Doctrinae Physicae*. A recent Open University course suggests that in fact a detailed study of Calvin’s writings reveals no actual reference to Copernicus at all. This course also points out that the quotation—‘Who will venture . . .’—which is traditionally attributed to Calvin stems from a 19th century history of science and belief in which the quotation is attributed to Calvin in undocumented form, and that subsequent historians have used this secondary source instead of checking their primary sources. But if, as seems probable, Calvin did not mention Copernicus, the charge that he led a bitter opposition against him falls to the ground.⁴

The writings of Calvin and Luther in fact reveal a positive approach to science by distinguishing between the authority and province of the different theoretical disciplines. Scripture was suited for the understanding of ordinary men and was not a scientific textbook. Many have claimed that the Reformers were tied to a literalistic view which demanded a trenchant defence against the new science. But this could not be further from the truth. Indeed in the 17th

century Voetius, a leading Dutch Calvinist, recommended a Roman Catholic commentary on Genesis because he felt that Calvin's commentary was too loose an approach to Scripture. Typically Wilkins, a Puritan, claimed that we can derive neither Aristotelianism or Copernicanism from the Bible as it was written in ordinary language. A good example is Kepler's explanation of Joshua commanding the sun to be still—from the point of view of man's ordinary experience the sun does not move. What scientist refuses, even today, to talk of the sunrise and the sunset? Calvin's approach to Scripture was an empirical one centred on a simple grammatico-historical exegesis over against tendencies to spiritualise and allegorise.

Thus Calvin can quite properly suggest that: "He who would learn astronomy, and other recondite arts, let him go elsewhere."⁵ This is no denigration of science for as he goes on, concerning astronomy:⁶

'Nevertheless, this study is not to be reprobated, nor this science to be condemned, because some frantic persons are wont boldly to reject whatever is unknown to them. For astronomy is not only pleasant, but also very useful to be known; it cannot be denied that this art unfolds the admirable wisdom of God.'

This is a positive view of astronomy. Indeed Luther, in distinguishing between astronomy and astrology, was among the first to do so—even Kepler indulged in both. But Luther could say: "I like astronomy and mathematics, which rely upon demonstrations and sure proofs. As to astrology, 'tis nothing."⁷ Calvin, likewise, wrote his 'Admonition against the Astrology that is called Judicial' (1549), while in the 'Institutes' he wrote:

"To investigate the motions of the heavenly bodies, to determine their positions, measure their distances, and ascertain their properties, demands skill, and a more careful examination; and where these are so employed, as the providence of God is thereby more fully unfolded, so it is reasonable to suppose that the mind takes a loftier flight, and obtains brighter views of his glory." (*Institutes*, 1:5:2)

Yet confusion rages concerning this topic and leading historians repeat the inherited myth that Luther and Calvin were implacable opponents of Copernicus in particular and science in general. But such mythology cannot bear close scrutiny. Those who oppose the thesis of a connection between the rise of modern science and the Reformation worldview quite fail to provide adequate alternatives, or allow Luther and Calvin to speak for themselves. Certainly care has to be taken over terms like 'Puritan' and 'Calvinism', but in general it can be said that those of this disposition were inclined, more than others, to take an active interest in science. This was an interest that saw in science a support to faith in God, but had not degenerated into the idea of science as a foundation for faith as would happen with the rise of Deism.

In positing a connection between Reformation and modern science it seems to me wrong to reduce this influence to a mere ethos—to see the factors as purely sociological and not doctrinal. I am being careful not to assert a pure doctrinal motivation for undoubtedly there were sociological factors, but there are positive features in reformed theology that bear on the issue. There was a general spirit of freedom and individualism, a deep love of nature as God's creation, that arose at this time; the influence of the break-down of Aristotelianism and the rising influence of neo-Platonism. But whatever the view from our century, there were those writing in the 17th century who saw a positive benefit accruing to science from the Reformation. Richard Bostocke could claim that the Reformation of religion was indispensable to the reformation of medicine; while Robert Boyle and John Cotton saw the study of nature as a positive Christian duty.

The followers of Calvin reveal a positive, if somewhat ambiguous, attitude towards science. Many maintained that theology should not be separated from physics and defended the Ptolemaic system against Copernicus. But not all theologians were thus inclined and Andre Rivet, perhaps the most influential reformed theologian of the Netherlands at that time, tended to favour Copernican views. He and others contended that Scripture might be the text for instruction in doctrine and righteousness, but it was not so for geometry and astronomy. In this context Kepler commented that 'our senses, too, have their own kind of truth'.

There are, then, diverse doctrines and attitudes flowing from Calvin which may be construed as giving impetus to science. Indeed it is worth noting that modern scientists of the status of Robert Oppenheimer and Werner Heisenberg have pointed to the Reformation basis without which modern science could not have been born. The basis is certainly not enumerated by these two eminent scientists or the reformers in the way that follows, but the points I set out are either explicit or implicit in the writings of the reformers and still apply today.

1. GOD THE CREATOR

Firm belief in the creatorhood of God led to firm belief in natural physical law. No longer was nature against grace as lower mundane against higher glory. Nature was not the home of the demonic but the creature of God. There was to be no wedge driven between the God of creation and the God of salvation. Perhaps the key was a new emphasis on the motif of 'creation, fall into sin, and redemption in Jesus Christ' which replaced the older scholastic dualism of nature and grace.⁸ Instead of reality being divided into realms of nature and grace there was one unified picture of nature which grace permeated and penetrated in the sustaining activity of the Creator. "Grace," wrote Herman Bavinck, a more contemporary Calvinist, "does not serve to take men up into a supernatural order, but to liberate him from sin. Grace is not opposed to nature, but only to sin."⁹

2. THE LAW OF GOD

This, of course, derives from the above. Even the Fall into sin did not obliterate the law-structure of God for the cosmos within which men lived and worked. Joseph Needham, who has done so much work in the history of science in China, notes that it was precisely the lack of the idea of an ordering deity, a supreme law-giver, that deprived Eastern culture from developing the sciences. This has also been suggested as a reason for the Greek failure to break through to modern concepts. The idea of law is a peculiarly Christian idea and one contemporary philosopher of science rails against it, recognising its origins, but unable to break from it. R. Harre writes:¹⁰

“The term ‘law’ is a survival . . . of a certain theory about nature, in which there was a law-giver. Since I do not hold this theory I have used the expression ‘law of nature’ as little as possible.”

The problem is that once we take away law from science, then we have no science left.

3. THE GLORY OF GOD

Some claim that this concept is not peculiar to Calvin. Indeed it would be odd if it were; but that does not alter the fact that Calvin took this concept and made it the fountainhead of his thought. The glory of God was, for Calvin, revealed in nature as well as in Christ and Scripture. “Meanwhile, being placed in this most beautiful theatre, let us not decline to take a pious delight in the clear and manifest works of God.” (*Institutes*, 1:14:20.) Man, in understanding the complexities of creation, was better able to praise and glorify the God who has created.

The theme of the glory of God expressly revealed in nature was utilised by Kepler (perhaps the first of modern scientists rather than Copernicus who was a confirmed adherent of Aristotelian circles) who was himself accused of crypto-calvinism. he writes in his *Mysterium Cosmographicum*:¹¹

“I am speaking of the Book of Nature, which is so highly esteemed in the Holy Scriptures. St. Paul admonished the Heathens to reflect on God within themselves as they would on the Sun in the water or in a mirror. Why then should we Christians delight the less in this reflection, seeing that it is our proper task to honour, to revere and to admire God in the true way? Our piety in this is the deeper and the greater is our awareness of creation and of its grandeur. Truly, how many hymns of praise did not David, His faithful servant, sing to the Creator, who is none but God alone! In this his mind dwelled reverently on the contemplation of the Heavens. The Heavens, he sings, declare the glory of God . . .”

4. THE CULTURAL MANDATE

It is in this setting that the call to work is to be seen. The mythology often foisted on Calvin and his followers is that they saw themselves elected to salvation and hence worked hard so as to prosper and gain reassurance. Nothing could display a more fundamental lack of understanding of reformed theology. The very suggestion is permeated by 'salvation by works'—a theme which Luther and Calvin were totally opposed to. To read their works, or any of the great confessions of the reformed churches, is to find a different concept of work. Hookyaas, commenting on the *Netherlands Confession* notes that what is there enshrined is the reality of works as a 'fruit', not an exercise in 'self-reassurance'. There was a positive attitude to work—all work. Knowledge and ability were gifts of God. In fact there was a strong utilitarian emphasis that created empathy with the crafts and also united with theoretical aspects. This was crucial for one of the factors which had blocked the birth of modern science had been the long established disjunction between head and hand, between philosopher and craftsman. But in the Reformation there was a worldview which at last united theory and craft. Whether minister or cobbler, preacher or magistrate, all were called by God to work within their own sphere of calling to the glory of God.

Connected to the mythology of work is that of predestination. This is often interpreted as providing a determinative causality in the area of man's relationship with God that had parallels with the rising mechanistic causality in science. This will not do. For Calvin, predestination was under the heading of salvation and not providence. There was little tendency to a hard determinism in Calvin. Nor can mechanism be seen as a restoration of Greek atomism, for the mechanistic philosophy that was arising emphasised the clever machinery of God who controlled all—a basic belief diametrically opposed to the blind fate of the atomists.

5. COMMON GRACE

This doctrine, while not developed, occurs in embryonic form in Calvin's thought. The doctrine sees truth and value in the works and thought of all men, Christian or not, at all levels of cultural life. The fall was extensive, not intensive, in effect. Here again one feels at times that Calvin's doctrine of the Fall is not clearly understood. He writes:

"To charge the intellect with perpetual blindness so as to leave it no intelligence of any description whatever, is repugnant not only to the Word of God, but to common experience Therefore, since it is manifest that men whom the Scriptures term natural, are so acute and clear-sighted in the investigation of inferior things, their example should teach us how many gifts the Lord has left in possession of human nature, notwithstanding of its having been despoiled of the true good if the Lord has pleased to assist us by the work and ministry of the ungodly in

physics, dialectics, mathematics, and other similar sciences, let us avail ourselves of it, lest, by neglecting the gifts of God spontaneously offered to us, we be justly punished for our sloth.” (*Institutes*, 2:2:12,15,16.)

Calvin was willing to learn and had a remarkably open attitude to many phases of thought. Indeed John Donne praised him, for whereas Melancthon would assert ‘It can be no otherwise than thus . . .’, Calvin would say ‘It seems to be thus . . .’

6. PRIESTHOOD OF ALL BELIEVERS

This helped further a spirit conducive to science, for the individual was responsible for reading the Book of Scripture and the Book of Nature for himself. Each was to find the truth and not rely on external authority of church or tradition, valuable as those might be. It was in the application of this that the unlearned began to be used in the collection of data for some of the botanical and zoological sciences.

7. GENERAL ETHOS

There was a *love of nature*. Along with the spirit of freedom that prevailed there was a love of nature in many Protestant scientists. This was corollary of the doctrine that all should learn to read the book of nature as it revealed the hand of God. There was also a *love of learning*. Reformers like Calvin and Knox are, of course, renowned for their educational vision.

From these seven points it seems to me wrong to charge Calvin(ism) with a negative or depreciative attitude to science, for both his own works and the spirit he advanced were conducive to the pursuit of science. Science was to be pursued because the more learned a person was concerning the works of God, the more he would be able to understand and praise the greatness of God. This, coupled with the positive injunction for all work to be under the calling of God, provided the basis for a positive view.

Calvin’s stress on the objectivity of nature and the need to acquire the facts pertaining to the world are indicative of the basic rules that the scientist was to assume. But if Calvin stressed the need to read the book of nature, he was also clear in pointing out that there was always a surd which was beyond analysis. In other words: while true knowledge was, and is, possible, man should be careful not to fall into the trap of thinking he can attain exhaustive knowledge, or that he can integrate knowledge in his own rationality. Today it is important to see this emphasis that knowledge can be objectively true though not exhaustive.

There were, of course, weaknesses in Calvin(ism) which should not be glossed over. The essential thrust was that of teaching, not research, and the impetus of science was left to the individual genius with little actual encouragement

from the church. Indeed as the Reformation became dissipated in the humanism of the age, involving a regression to Aristotelianism, Calvinism became a progressively diluted force in society. This meant that the latent potential of the Calvinist worldview was never fully realised, the initial thrust was lost, the unified motif dissipated and the scholastic motif of nature and grace reinstated.

But there is much we can learn from the Reformation perspective on science as we in our day seek to work towards a Christian perspective on the natural sciences. I would hesitate to suggest we need a theology of science, but we do need a theological framework within which to understand the place and purpose of our scientific activity.

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IMMANUEL VELIKOVSKY David Tyler

The death of Immanuel Velikovsky in November 1979 is sufficient justification for commenting on the scheme of history propounded by this remarkable man. In 1954, Velikovsky's best known book was first published, with the title *Worlds in Collision*. So controversial was it that, for many scientists, Velikovsky's theories became synonymous with the delusions of a crackpot, and he never succeeded in recovering the position. Instead of being a scholar with unconventional ideas, Velikovsky was generally thought of as a charlatan whose ideas were not worthy of serious debate.

One of Velikovsky's early interests was the subject of psychoanalysis. His original and controversial step was to "psychoanalyse" the human race, by seeing in the recorded myths and legends of ancient people graphic and detailed accounts of heavenly conflagration and catastrophe. With the advent of more peaceful times, the human race, he argued, is now suffering from a collective amnesia, replacing the disturbing memories of chaos and crisis by the reassuring belief that the heavens have always been as they are now.

The scheme of events envisaged by Velikovsky is that many thousands of years ago, the positions of the planets were significantly different from what they are today. Jupiter suffered some kind of disturbance and as a result emitted a proto-planet, which is now known as Venus. Some time later, Venus came very close to the Earth, and caused widespread devastation. This was, according to Velikovsky, at the time of the Exodus of the Israelites from Egypt. Many years later, during the reign of Hezekiah, king of Judah, a near-collision occurred between Mars and the Earth. Since those days, the planets have settled into their present, apparently stable orbits. "Worlds in Collision" contained extraordinarily detailed arguments and used extensive archaeological and literary evidence to support the scheme. For the next 25 years, Velikovsky was untiring in his studies to develop and defend his ideas. More recently, he has been joined by a considerable number of competent scholars. In America, the journal *Kronos* publishes the results of Velikovskian research; and in the U.K. the *S.I.S. Review* is committed to providing a forum for debating his theories.

In a brief article, it is inevitable that comment must be restricted. The following points are thought to be of relevance to creationists.

1. **The attitude of the scientific establishment to unorthodox ideas.**

The years of controversy have provided ample evidence that scientists often fail to achieve the standards of open-mindedness and lack of prejudice they set for themselves. The sad tale of Velikovsky's treatment by the "orthodox"

scholars is full of interest. For further reading on this point, *The Velikovsky Affair* should be consulted. (Edited by A. de Grazia, 1966, out of print). Creationists, of course, not only have similar reactions to their unorthodox ideas but there is also the additional hostility to the testimony that God is the creator of all things and that he has acted in miraculous ways in the course of history.

2. The significance of Velikovsky's revision of the chronology of ancient Egypt.

Being of Jewish blood, Velikovsky has inherited a respect for the Old Testament Scriptures. Whilst he shows no evidence of believing that they are the Words of God, he has approached the historical records in a way that puts many Christian scholars to shame. We are particularly concerned here with the record of the Exodus. Christian scholars have recognised problems in this area for a long time: the archaeological evidences bear no relation to the requirements of Biblical history. None of the alternative views that are discussed in the literature can be described as satisfactory. Velikovsky recognised the problem and concluded that the Biblical history must stand as reliable. It followed that Egyptian chronology stands in need of revision. Velikovsky's book *Ages in Chaos* records his radical approach to the problem and traces synchronisms between Israel and Egypt from the Exodus onwards, through to the reigns of Solomon and the divided kingdom. This chronological revision should be evaluated separately from Velikovsky's astronomical catastrophism: the astronomical catastrophe theories require a revision of chronology, but the revision of chronology does not depend in any way upon the validity of the astronomical catastrophe theories.

A final comment is concerned with the relevance of the Velikovskian theories to creationism. Why should we take note of the theories of planetary collisions in the recent past? The answer is that since the evidences for global catastrophism are unmistakable, people will become more and more dissatisfied with the dogma of uniformitarianism. Many of the new catastrophists will be attracted by the Velikovskian approach, and this school of thought can be expected to grow in importance. It is sad that a number of creationists, particularly in America, have sought to combine astronomical catastrophe ideas and Biblical creationism. It is not the intention here to provide a critical discussion of the issue, but merely to point out the importance of being guided in all our thinking by the framework of history as recorded in the Bible. It takes only a vivid imagination to propose theories of global catastrophe, but creationists claim to be realists, not dreamers.

Review Article

SCHUMACHER AND THE THEORY OF EVOLUTION

David Pott

Dr E.F. Schumacher was, during his life-time, something of a guru for the Neo-Arcadians, and since his death he has continued to be read very widely. His best known book *Small is Beautiful* is a penetrating attack on the idea that Growth and Progress are the vital objectives for a technological society. But Schumacher was no Luddite. He believed passionately in the use of appropriate technology.

Unlike so many social critics, Schumacher also pointed the way to answers to the dilemmas of modern society. His *Guide for the Perplexed* (Jonathan Cape 1977) is an attempt to provide people with a map of life and knowledge, so that we may give the important features of life their proper prominence. Schumacher had a very high regard for eastern religious traditions and the fact that his answers fall well short of a full-orbed Biblical position has been shown elsewhere.¹ What is of particular interest to readers of this journal is that in this book and also in *Good Work* (Jonathan Cape 1979) Schumacher shows that science does not in itself provide the answers to the vital questions of life, as it so often claims to do. "The Cartesian revolution has removed the vertical dimension from our map of knowledge, only the horizontal dimensions are left . . . Modern science answers the question 'What is man?' with such inspiring phrases as 'a cosmic accident' or 'a rather unsuccessful product of mindless evolution or natural selection' or 'a naked ape', and it is not surprising that it was no answer to the question of what this absurd accidental product of mindless forces is supposed to do with itself."²

Schumacher has no quarrel with the concept of evolution as a generalised description of biological he is highly critical of the Doctrine of Evolutionism which "offends against all principles of scientific probity . . . Imagination and speculation run riot; anything will do to explain everything . . . As the origin of life is described as 'a major step in evolution', we are asked to believe that inanimate matter is a masterful practitioner of natural selection. For the Doctrine of Evolutionism, any possibility, no matter how remote, is perfectly acceptable as scientific proof that the thing actually happened."³

Schumacher sees Evolutionism as a "peculiarly degraded religion, many of whose high priests do not even believe in what they proclaim".⁴ And yet this substitute religion has been accepted by many, and he quotes Martin Ling's comment that "in the modern world more cases of loss of religious faith are to be traced to the theory of evolution as their immediate cause than to anything else."⁵ Schumacher believes that Evolutionism is "science fiction, even a kind

of hoax which has succeeded too well and has imprisoned modern man in an irreconcilable conflict between 'science' and 'religion'."6 It is true that "many people try to live out their lives in a tepid and precarious combination of religion and evolutionism. But for the more logically minded there is no option but to choose between the two, that is between the doctrine of the fall of man and the doctrine of the rise of man, and to reject altogether the one not chosen."7

So Schumacher's books can do a great deal to stimulate our thinking about the application of Biblical principles to the problems of our day. Furthermore he realises that we cannot begin to come to any answers until we look to our Creator, who has revealed His will and plan to us. "It would be most improbable that the Creator could have put into life such loquacious beings as you and I and never said a word to us. This is called by the simple word 'revelation'."8 Schumacher was certainly unorthodox in his theology, but few BC readers would quarrel with *that* opinion!

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The June 1980 issue of *BC* contained a copy of the Constitution of the *Biblical Creation Society* and a provisional roll of members. We publish here a revised Constitution incorporating important changes approved in the recent ballot, and an additional members' list, bringing the roll up to February of this year.

CONSTITUTION OF THE BIBLICAL CREATION SOCIETY Revised December 1980

I Name of the Society

The name of the Society shall be the Biblical Creation Society.

II Aim

The aim of the Society is to demonstrate the importance of the Biblical teaching on Creation, and its incompatibility with the general theory of organic evolution. Our purpose is to encourage informed discussion of the origins of man and the world from a Biblical perspective, especially in the world of education.

III Organisation

1. *Membership.* Membership of the Society is open to professing Christians who are in agreement with the Aim and Doctrinal Basis of the Society. The Doctrinal Basis is given below.
2. *Committee.* The Committee of the Society shall be responsible for the co-ordination and organisation of the Society's activities. The Committee shall comprise 11 elected members, including the following officers of the Society: Chairman, Secretary, Assistant Secretary, Administrative Secretary, and Treasurer. A maximum of 4 additional members may be co-opted. A Business Manager may be appointed by the Committee, and shall be an ex-officio member of the Committee.
3. *Elections to the Committee.* Elections to the Committee shall be for a period of not more than 3 years. Vacancies occurring on the Committee owing to resignation, death, or some other cause may be filled at the Committee's discretion by co-option or election. Such appointments shall last only until the next election for the full Committee. Retiring members of the Committee shall be eligible for re-election.

A candidate for election to the Committee must have been a paid-up member of the Society for one year prior to the date of the election, and must be nominated by two members similarly qualified. All members thus qualified are entitled to vote.

Constitution

4. *Honorary President and Vice-Presidents.* An Honorary President and Honorary Vice-Presidents may be appointed, by invitation of the Committee. The Honorary President shall be an ex-officio member of the Committee.

IV Finance

Rates of subscription shall be determined by the Committee. The Treasurer shall provide accounts of the Society to each Committee meeting, and annually a statement of accounts to members. No member of the Committee shall be appointed to any office of the Society paid by salary or fees or receive any remuneration or other benefit in money or money's worth from the Society, out of pocket expenses properly incurred in the performance of duties for the Society excepted.

V Doctrinal Basis

The Doctrinal Basis of the Society shall be the fundamental truths of Christianity, as revealed in Holy Scripture, including:

- a) The unity of the Father, the Son, and the Holy Spirit in the Godhead.
- b) The sovereignty of God in creation, revelation, redemption, and final judgment.
- c) The divine inspiration and infallibility of Holy Scripture as originally given, and its supreme authority in all matters of faith and conduct.
- d) The universal sinfulness and guilt of human nature since the Fall, rendering man subject to God's wrath and condemnation.
- e) Redemption from the guilt, penalty, and power of sin *only* through the sacrificial death (as our Representative and Substitute) of Jesus Christ, the Incarnate Son of God.
- f) The resurrection of Jesus Christ from the dead.
- g) The necessity of the work of the Holy Spirit to make the death of Christ effective to the individual sinner, granting him repentance towards God and faith in Jesus Christ.
- h) The indwelling and work of the Holy Spirit in the believer.
- i) The one holy universal Church, which is the body of Christ, and to which all true believers belong.
- j) The expectation of the personal return of the Lord Jesus Christ.

VI Change of Constitution

Any proposed change in the Constitution, to be effective, must be passed in a ballot of all members of the Society qualified as in Section III.3., by a majority of at least three-quarters of those actually voting. Such a ballot shall be called upon receipt by the Secretary of a request signed by not less than ten members of the Society similarly qualified. Any changes in the Constitution will be notified to the Inland Revenue

Claims Branch to ascertain whether any such alteration would jeopardise the charity status of the Society.

VII Dissolution

In the event of the winding up of the Society any assets remaining after the satisfaction of all proper debts and liabilities will be made over to another Charity in law or applied to a purpose charitable in law.

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